



UNITED STATES  
ATOMIC ENERGY COMMISSION  
DIVISION OF COMPLIANCE  
REGION II - SUITE 818  
230 PEACHTREE STREET, NORTHWEST  
ATLANTA, GEORGIA 30303

TELEPHONE: 426-4537

APR 22 1969

J. P. O'Reilly, Chief, Reactor Inspection and Enforcement Branch  
Division of Compliance, Headquarters

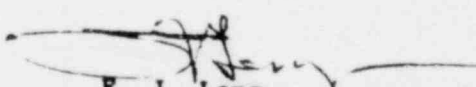
CAROLINA POWER AND LIGHT COMPANY, DOCKET NO. 50-261  
CONSOLIDATED EDISON COMPANY OF NEW YORK, DOCKET NO. 50-247, 286  
FLORIDA POWER AND LIGHT COMPANY, DOCKET NO. 50-250, 251  
ROCHESTER GAS AND ELECTRIC COMPANY, DOCKET NO. 50-244  
WISCONSIN-MICHIGAN AND WISCONSIN ELECTRIC POWER COMPANY, DOCKET NO.  
50-266, 301

Transmitted herewith for action are Compliance Reports covering the Westinghouse, Lester, Pennsylvania, shop inspection on March 18-21, 1969. In addition to the subject licensees, reference is made in Exhibit E of the report to Connecticut Yankee (Haddam Neck) and Southern California Edison (San Onofre). Two items of nonconformance described in the report are significant, especially in view of prior shipment of some of the steam generators for facilities both operating and now under construction. I recommend that the two items be discussed directly with the licensees, since Westinghouse indicated to the inspector that they plan to take followup action on all affected units.

Our metallurgist states that under certain conditions, stress relieving may not be necessary. For example, ASME Section III, N-518.3, permits such welding of attachments under conditions described therein, but also allows exceptions in Table N-532.

Copies of the report are being sent to Regions I, III, and V for information.

CO:II:FJL

  
F. J. Long  
Senior Reactor Inspector

Enclosures:

CO Report Nos. 50-261/69-5,  
50-247/69-4, 50-286/69-4,  
50-250/69-6, 50-251/69-3,  
50-244/69-6, 50-266/69-4,  
and 50-301/69-3 (23)

*See: Docket 50-261  
for Insp. Rpt*

cc: R. W. Kirkman, CO:I  
B. H. Grier, CO:III  
R. W. Smith, CO:V



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*15/RHE 6/19/69*  
*OR*  
*JN*  
*JLH*  
*LK*  
*BHR*  
  
F. J. Long

Senior Reactor Inspector

CO:II:FJL

Enclosures:

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and 50-301/69-3 (23)

*X - Referred docket*

cc: R. W. Kirkman, CO:I  
B. H. Grier, CO:III  
R. W. Smith, CO:V

9 2179

U. S. ATOMIC ENERGY COMMISSION  
REGION II  
DIVISION OF COMPLIANCE

Report of Inspection (Vendor)

CO Report Nos. 50-261/69-5  
50-247/69-4  
50-286/69-4  
50-250/69-6  
50-251/69-3  
50-244/69-6  
50-266/69-4  
50-301/69-3

Licensees:

Carolina Power and Light Company  
Robinson 2

Consolidated Edison Company of New York  
Indian Point 2 and 3

Florida Power and Light Company  
Turkey Point 3 and 4


Rochester Gas and Electric Company  
Ginna Plant

Wisconsin-Michigan Power Company  
and Wisconsin Electric Power Company  
Point Beach 1 and 2

Date of Inspection:

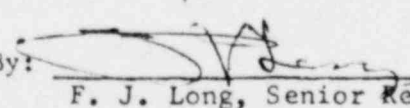
March 18-21, 1969

Inspected By:

  
J. M. Varela, Reactor Inspector (Const.)

4-22-69  
(Date)

Reviewed By:

  
F. J. Long, Senior Reactor Inspector

4-22-69  
(Date)

and Dupe of 8111160002

### SCOPE

An announced inspection was made at the Westinghouse Electric Corporation, Lester, Pennsylvania, plant. The purpose of the visit was to determine the quality level of the manufactured products and the essential documentation. The inspection was limited to the steam generators. (The pressurizers are being fabricated in Tampa, Florida.)

### SUMMARY

*with subject?*  
Nonconformance Items - There were two nonconformance items:

1. Open cans of low-hydrogen electrodes were seen in the stockroom and in the shop welding area, and workers were observed obtaining a supply from the open cans. (See Section G. 1.)
2. The -7 nut plates on the channel heads of the steam generators (Drawing 679-J-442) were not stress relieved or magnetic particle (MT) inspected as called out on the drawing. The above requirement apparently has been overlooked on all steam generators fabricated to date. (See Section G.2.)  
*G.2.*

*G.1.*  
Other Significant Items -

1. The Manager of Quality Control works directly for the Manager of Manufacturing.
2. No inspections are performed to verify cladding thicknesses, which, according to Westinghouse specifications, should be 1/4-inch minimum.
3. Initials are used by inspectors to signify acceptance of an operation or inspection point instead of either a controlled numbered stamp or the inspector's signature.

Management Interview - All the persons listed in Detail, Section A, except Vojtecky and Hibbert, were present for the interview.

#### 1. Quality Control Organization

The inspector stated that many authorities agree that quality control should not be a function of the Production Department. The QC people indicated their approval; however, Reynolds and Irving stated that Westinghouse has had years of satisfactory experience and success with this type organization. The inspector did not pursue the point. After the interview, several quality control personnel indicated their pleasure over the question being raised. As the inspector was leaving

the plant, Jenkins stated that a similar observation was currently being made by Westinghouse in the course of their own appraisals of prospective vendors.

In a telecon the following week, Irving and Reynolds advised the inspector that the minutes of the meeting, which had been distributed to top management, already had produced favorable results and indicated that an organization change was in progress.

2. Low-Hydrogen Electrodes

The inspector discussed the improper storage and control of low-hydrogen electrodes; and Reynolds countered that since they were not using these electrodes on nuclear work, they were not the inspector's concern. The inspector stated he, Earle, and Klossin had seen open cans of E7018 electrodes by the steam generators and that it was in violation of Westinghouse specifications. Irving agreed with the inspector and added that steps would be taken to correct the condition.

3. The -7 Nut Plates

The inspector's mention of this item was accepted with only minor comment. Westinghouse stated that although it was an oversight, stress relieving and magnetic particle inspections would be performed in the field.

4. Inspection of Cladding

The inspector asked why Westinghouse did not inspect the cladding thickness. Reynolds replied that Westinghouse guarantees the cladding for five years and has never had a failure. The inspector commented that drawings indicated the cladding should be 1/4-inch minimum thickness. Reynolds' defense was, "With our cladding process, we know that we have 1/4-inch minimum."

DETAILS

A. Persons Contacted

D. A. Jenkins - QC Engineer A.P.D.  
O. J. Earle - Manager Quality Control  
C. W. McKee - H. T. D. QC Engineer  
C. R. Kline - Supervisor QC (Receiving and Source Inspection)  
R. D. Milos, Jr. - Manager Contracts and Projects

E. R. Klossin - H.T.D. QC Engineer  
H. J. Wolff - H.T.D. Engineering  
D. E. Irving - H.T.D. Customer Service  
F. X. Brown - Tampa  
S. D. Reynolds, Jr. - Manager, Metallurgy  
J. S. Vojtecky - QC Representative, Pressure Vessels, Pittsburgh  
F. Hibbert - QC Supervisor

B. General

Arrangements for the inspector's visit were made by the principal inspectors of pressurized water reactors for Region I and II, through the respective licensees.

The inspector's initial Westinghouse contact was D. E. Irving of Customer Service. Irving escorted the inspector to the quality control offices in the fabrication building and introduced the QC supervisors of the Lester plant and Vojtecky, the QC Representative from Pittsburgh.

QC Manager Earle, Klossin, and Vojtecky discussed the Westinghouse quality control way of life in a lecture fashion, which made it difficult to note the salient items. It became evident to the inspector that Westinghouse was unprepared and unfamiliar with Compliance-type inspections when Klossin asked, "What is the real nature of your visit?" The inspector outlined the Commission's regulatory program and added that in order to arrive at a confidence level of their product, it would be necessary to observe a demonstration of quality control by randomly selecting items of record, scrutinizing these items, and then comparing them to the as-built hardware.

The inspector added that before leaving he would like to meet with concerned personnel and briefly review his observations in order to avoid any incorrect conclusions the inspector may have drawn.

The next day the inspector directed his efforts to the following:

1. Organization
2. Inspection Point Program (IPP)
3. Steam Generator and Pressurizer Status
4. Radiographic Inspection
5. Inspection of Steam Generators



C. Organization (See Exhibit A)

The organization and functions, with few exceptions, have features of the Navy Nuclear program and, in general, is better oriented to the nuclear business than most programs observed by the inspector. Some exceptions which are on the "minus" side are the following:

1. The Production Manager is also the Manager of the Quality Control Department. This organizational weakness has been discussed considerably in the past.
2. Item 5 under QC Engineering, the IPP (Inspection Point Program), is an excellent tool if the shop inspectors do not depend entirely on it, thereby overlooking the unexpected. For example, the -7 plate was not on the IPP list, although the requirements were clearly indicated on the applicable shop drawing.

Of special interest is Item No. 10 under QC Engineering. The inspector verified that personnel are indeed periodically tested and qualified for NDT as required and found that two of the "old timers" had recently failed to qualify when retested in accordance with Westinghouse requirements.

D. Inspection Point Program (IPP) (See Exhibit B)

1. Upon receipt of each new shop order, an IPP is initiated in the pertinent inspection station and placed in a shop order folder.
2. The shop order folder follows the work through the various manufacturing sections until the unit is completed.
3. Responsibilities for record maintenance are:
  - a. Inspectors must properly fill out and keep the IPP's up to date.
  - b. QC engineers maintain and update programs as required, audit shop order records for adherence to established rules, and review and file the completed folders in the QC office.

E. Quality Control Supervisor

Duties of the QC supervisor include reviewing and checking to see that the folders are maintained by each shift and that the folders are at the proper inspection station, and delivering completed folders to the Quality Control office.

Complete records of other objective evidence for each shop order are maintained in the Quality Control office. A folder is initiated upon receipt of each new confirming order and is placed in numerical sequence in the open order file by the clerk in the Quality Control office.

Upon shipment of each unit and delivery of the IPP and other shop records to the Quality Control office, the records are merged with the office file covering the same unit, and the combined records are placed in the "shipped" file. The following sequence permits the record information to be easily obtainable:

1. Shop record folders
  - a. All appropriate IPP's
  - b. Welder records
  - c. Preheat records
  - d. Tube welding, PT, gas test and repair charts
  - e. MT records
2. Backup information - in chronological sequence within the following categories:
  - a. Order Service or Customer Service data
    - (1) Order sheet
    - (2) G.O. change notices
    - (3) Correspondent memos
  - b. Engineering shop order pages
  - c. Inspection memos to suppliers
  - d. Drawing change notices
  - e. H/T procedure
  - f. H/T records
  - g. UT records
  - h. G-Sheets
  - i. EA's and EAN's
  - j. X-ray reports
  - k. Certificate of test
  - l. Field service records

F. Radiography

The inspector was impressed with Holmes, who is in charge of the radiographic laboratory. Holmes has been at this post for over 25 years and produced evidence of his interest in this skill by the courses, symposiums, etc., that he has attended in an effort to keep up proficiency. Holmes is the final radiographic interpreter. The



Lester plant of Westinghouse has two other professionals in this field, J. Gillian and W. Gibson. All three were also qualified to NAVSHIPS 50-250-1500. Gibson and Gillian have the responsibility for examination, testing, and qualifying NDT personnel.

The film and technique selected by Holmes produced very good contrast and image sharpness which in part indicated the use of slow, fine-grain film producing the maximum resolution.

The channel head casting weldments (Drawing 794-D-219) of the steam generator are radiographically prepared and examined to Section III of the ASME Code. In this area, quality control and inspection were excellently demonstrated.

#### G. Inspection of Steam Generators

While awaiting to be escorted to the fabricating shop, the inspector made a cursory study of applicable steam generator drawings and specifications and observed items that did not appear to be on the IPP inspection list.

##### 1. Nut Plate Welds (Nonconformance)

*744-5 material?*  
The shop was very well organized, with the nuclear work on one end of the building and the nonnuclear occupying the other half. The first items inspected were the insulation nut plate attachments (under ASME Section III, N518.3 and N518.4) on the channel heads. The inspector inquired of Klossin and Earle if the nut plates on the channel heads (attachments) were inspected. Klossin stated that there were no inspection requirements and proceeded to check the applicable drawing. Westinghouse Drawing 679-J-442 indicated that the 1/4-inch fillet welds were fabricated to Specification 600923SR (stress relieve) and 60019MT-F (Magnetic Particle Inspection). (See Exhibit C.) Klossin admitted that Westinghouse had overlooked the drawing callout and Code requirements.

##### 2. Electrode Storage (Nonconformance)

During the shop tour, the inspector observed workmen obtaining E7018 (low-hydrogen) electrodes from open containers. A check of Westinghouse specifications on electrodes disclosed the following statement: "All electrodes removed from containers shall be baked for a minimum of one hour at 525  $\pm$  25° F prior to welding. Electrodes shall not be exposed to the atmosphere

for a period longer than four hours. Wet electrodes shall be discarded." A further check by Klossin and the inspector disclosed open containers of electrodes (low-hydrogen) in the supply room. Klossin stated that he would discuss this discrepancy with his management.

3. Steam Generator Cladding

While observing work on the steam generator channel heads, the inspector saw a workman inside of the channel head grinding weldments. The inspector borrowed the workman's extension lamp and inspected the cladding. Finding a depression in the cladding, the inspector asked Klossin and one of the Westinghouse inspectors standing nearby what the specified minimum thickness of the cladding was and how it was measured. Neither of the two questions were satisfactorily answered at this time or later at the management interview. The most official answer was that given by Reynolds, the Westinghouse Metallurgical Manager, who stated that the integrity of the cladding is assured by a process which has had zero failures. The inspector, using a vernier depth gage, determined that weld passes had some localized depressions .090-inch deep, and concluded that the only means of determining the cladding thickness would be by obtaining a core of a questionable area. The inspector considers this question unresolved.

4. Tube Welds (See Exhibits D)

The inspector spent considerable time inspecting and observing the welding of the tube-to-tube plate welds. The Exhibit describes the inspector's observation. According to Westinghouse personnel, they have made over 320,000 tube-to-tube plate welds without experiencing a failure; and this is why Westinghouse now offers a five-year warranty against leakage of welded joints between tubes and tube-plate on all domestic orders.

5. Reheater Unit (Nonnuclear)

In the course of a side trip to another section of the shop, the inspector observed what appeared to be deep die stamping (letters and numbers) on the head (casting) of a reheater. Klossin and Earle, when questioned about the stamping, stated that the reheater was fabricated to ASME Section VIII, UHT-86, which specifies that only "low stress" stamping is permissible. Klossin and Earle agreed that the inspector's observations were correct and indicated they would investigate procedures and persons responsible. It was later learned that the tool crib had purchased

the "low stress" stamps but that they had received "little or no use" as stated by an attendant. QC Manager Earle stated that the stamping on the reheaters would be ground off, NDT'd, and corrected if required. The inspector stated his interest in this item was only as a basis for evaluation of shop performance realizing that the reheaters are not considered Class I components.

H. Status of Steam Generators and Pressurizers (See Exhibit E.)

Attached as Exhibit E is a list of components being supplied by Westinghouse. Exhibit E shows components shipped and components which are pending shipment. As indicated, fabrication of pressurizers is being transferred to the Tampa plant.

Attachments:

Exhibits A through E

MANAGER  
OF  
MANUFACTURING

MANAGER  
OF  
QUALITY CONTROL

QUALITY CONTROL ENGINEERING

J. Guy Ass. Q.C.E. (Cond. & Mach.  
Sep. Reheaters)  
E. Klossin Ass. Q.C.E. (Nuclear Power)  
(Auxiliaries)

PROCUREMENT QUALITY ASSURANCE

C. W. McKee Q.C. Eng.  
G. Patchel Inspector (Tubes)

FUNCTIONS (Preventative)

- (1) Analyze contract proposals for quality capabilities.
- (2) Review Engineering design for quality assurance.
- (3) Audit and analyze shop problem and determine correction thereof.
- (4) Determine quality adequacy of Manufacturing or special processes.
- (5) Plan for quality by writing I.P.P. (Inspection Point Program).
- (6) Develop new inspection controls and procedures.
- (7) Keep current with relevant trends in Q.C. controls.
- (8) Maintain EAN procedure.
- (9) Review purchase orders for inclusion of quality requirements.
- (10) Test examine personnel for non-destructive test qualification.
- (11) Maintain objective evidence of quality.

FUNCTIONS (Preventative)

- (1) Verify quality of purchased material.
- (2) Audit vendors Q.C. practices and procedures.
- (3) Audit potential supplier for capability and controls.
- (4) Assist and advise vendors in our quality requirements and processes.
- (5) Provide feedback and improve communications.
- (6) Evaluate vendors.
- (7) Assure that suppliers maintain objective evidence of quality and adherence to Westinghouse drawing requirements.

MANAGER  
OF  
MANUFACTURING

MANAGER  
OF  
QUALITY CONTROL

INS PECTION  
Q.C.Supervisors  
F. Hibbert 1st shift  
E. Csanady 2nd shift

1st shift	2nd shift	3rd shift
12	7	4
Inspectors	Inspectors	Inspectors

FUNCTIONS (Appraisal)

Assure conformance to Westinghouse drawings, processes, and Manufacturing specifications by:

- (1) First piece inspection.
- (2) Patrol Inspection
- (3) Final inspection.
- (4) Dimensional check.
- (5) Maintaining I.P.P. program and objective evidence.
- (6) Non-destructive testing including M.T., P.T., and gas and hydrostatic test.
- (7) Establish torque requirements for tube rolling.

RADIOGRAPHIC LABORATORY  
Supervisors  
F. Hibbert 1st shift  
E. Csanady 2nd shift

1st shift	2nd shift
1 Class A Radiog.	1 Class A Radiog.
1 Class C Radiog.	1 Class C Radiog.

FUNCTIONS

- (1) Establish techniques to be used for radiographic test.
- (2) Lay out work and set-up equipment for X-ray or gamma radiography.
- (3) Complete radiographic exposure and process film.
- (4) Interpretation of radiographs to code specifications.
- (5) Conduct ultrasonic tests.
- (6) Maintain radiographic records.

EQUIPMENT

- (1) 2 MEV Van de Graft.
- (2) 400 KVA Siefert.
- (3) 200 KVA Balteau Unit.
- (4) 62 curies cobalt 60.
- (5) 50 curies iridium 192.
- (6) 2 sperry ultrasonic.

*[Faint, illegible handwritten notes]*

070. 570-3-472 SUB

THE FOLLOWING SPECIFICATIONS ARE REQUIRED AS NOTED:

PT - 21010 PUNCTURED 25000 10 10 500174 REV.

A CHECK SETUP AND CLIPPING

2. DOCUMENT AS PER SEC. 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 8

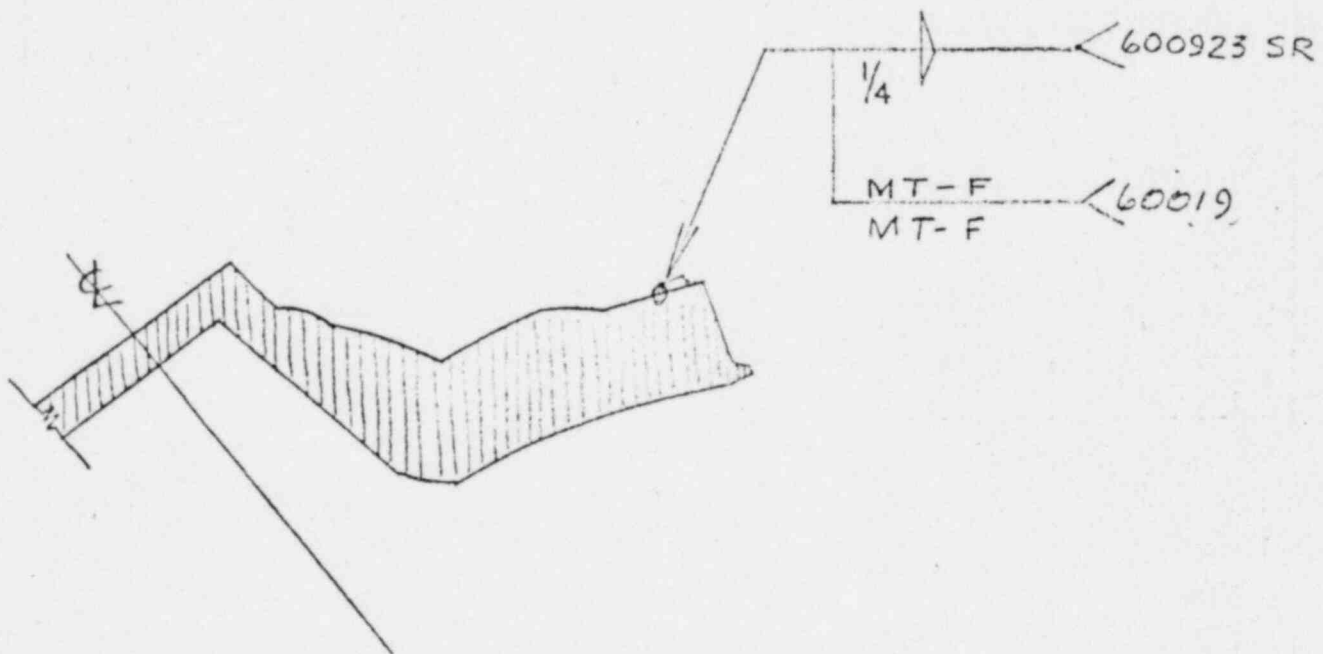
#### A. INSPECT GROUP



5. WELD PLUGS AS PER DWG
  - A. INSPECT WELDING OF PLUGS
6. GRIND WELD AT PLUG TO CHANNEL WELD JOINT FLUSH IN PREPARATION FOR CLADDING
  - A. CHECK THAT WELD IS FLUSH
7. SHOTBLAST INSIDE ONLY
  - A. INSPECT CLEANLINESS
8. CONVERT WELDING MACHINE FROM CONVENTIONAL AUTO WELDING TO SERIES ARC WELDING
  - A. CHECK CONVERSION OF MACHINE
9. SETUP ON POSITIONER USE I.O. AS PICTURE 1 P529.0002
  - A. PREHEAT AS PER SPEC. FOR AS PER SPEC. (1) LAYER IN SPHERICAL PLUGS - SOAK AS PER SPEC. (REMARK 110.0002)
  - B. CHECK PREHEAT RECORD ON IT 1007-A
  - C. RECORD WELDING ON IT 1007-A
  - D. CHECK SOAK - RECORD ON IT 1007-A
10. (ON POSITIONER) I.O. FOR REMOVAL OF PLUGS FROM RAILWAY AND NOZZLE POSITIONER - USE HOLE IN CENTER OF PLUG AS GUIDE
  - A. CHECK LAYOUT
11. ARC AIR PLUGS FROM MACHINING TABLES AS PER I.O. FOLLOW PROCEDURE AS PER SPEC. FOR REMOVAL OF PLUGS
  - A. REMOVAL OF PLUGS
12. REMOVE PLUGS - REMOVE FUMES & SPATTER FROM CLADDING AND CLEAN CLADDING
  - A. CHECK FOR CLEANLINESS
13. SETUP - I.O. - PREHEAT WELDING TABLE AT BOTTOM OF NOZZLES AT SPHERICAL END OF RAILWAY WELD CLADDING AND GRIND NOZZLES IN PREPARATION FOR CLADDING - GRIND AND BLEND MACHINE END OF RAILWAY WELD CLADDING
  - A. CHECK PREHEAT - RECORD ON IT 1007-A
  - B. CHECK GRINDING AND BLENDING

etc.

# -7 NUT PLATE



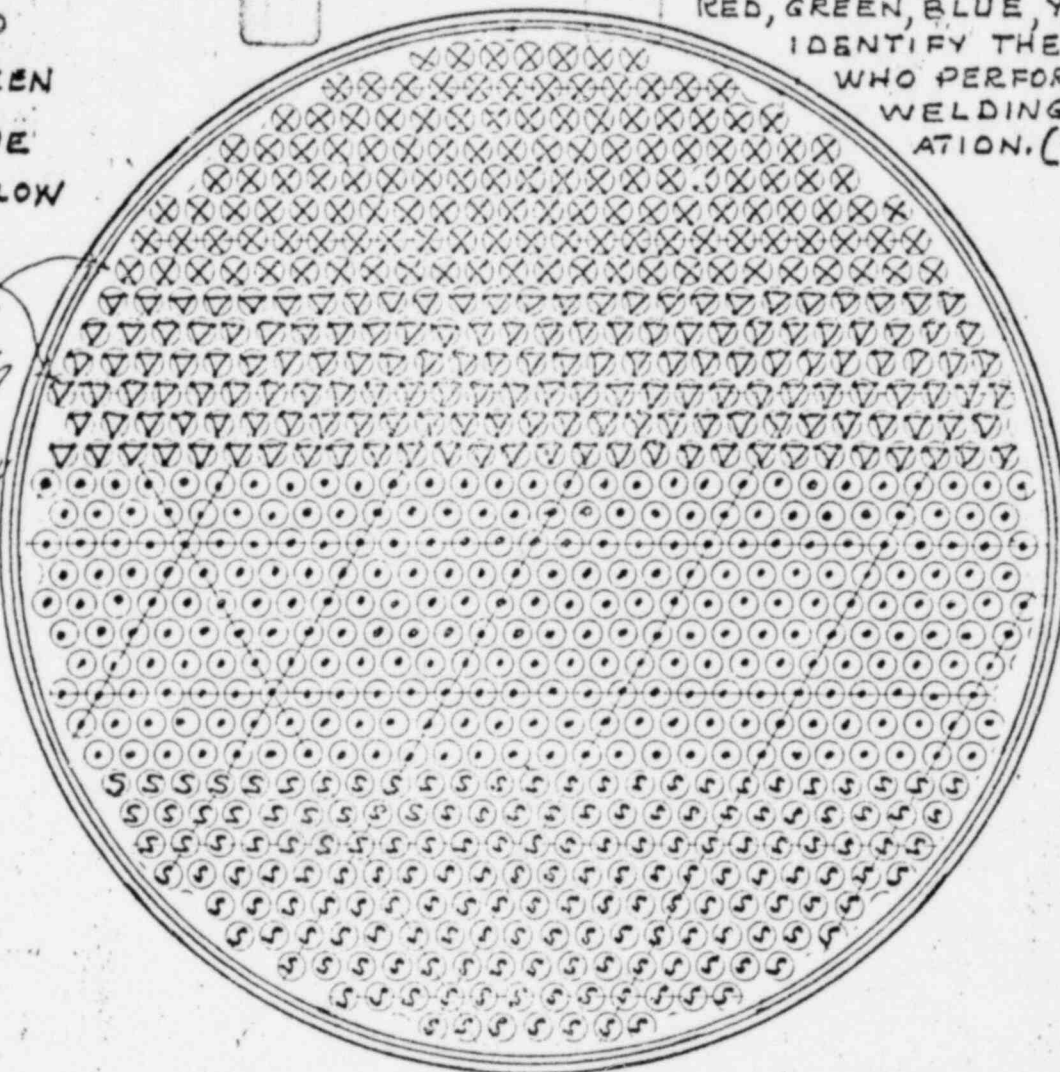
COOLANT CHANNEL ASSEM. TAKEN FROM  
DWG. NO. 679 J. 442 TO SHOW  
REQUIREMENTS FOR STRESS  
RELIEVING (SR) AND MAG. PARTICLE  
TEST (MT)

# TUBE-TO-TUBE SHEET WELDS (A)

- ⊗ = RED
- ▽ = GREEN
- = BLUE
- Ⓢ = YELLOW

RED, GREEN, BLUE, YELLOW,  
IDENTIFY THE MAN  
WHO PERFORMS THE  
WELDING OPER-  
ATION. (TIG)

THE ABOVE SYMBOLS  
ARE THE INSPECTORS  
(AEC) — USED IN PLACE  
OF COLORS USED  
BY Westinghouse



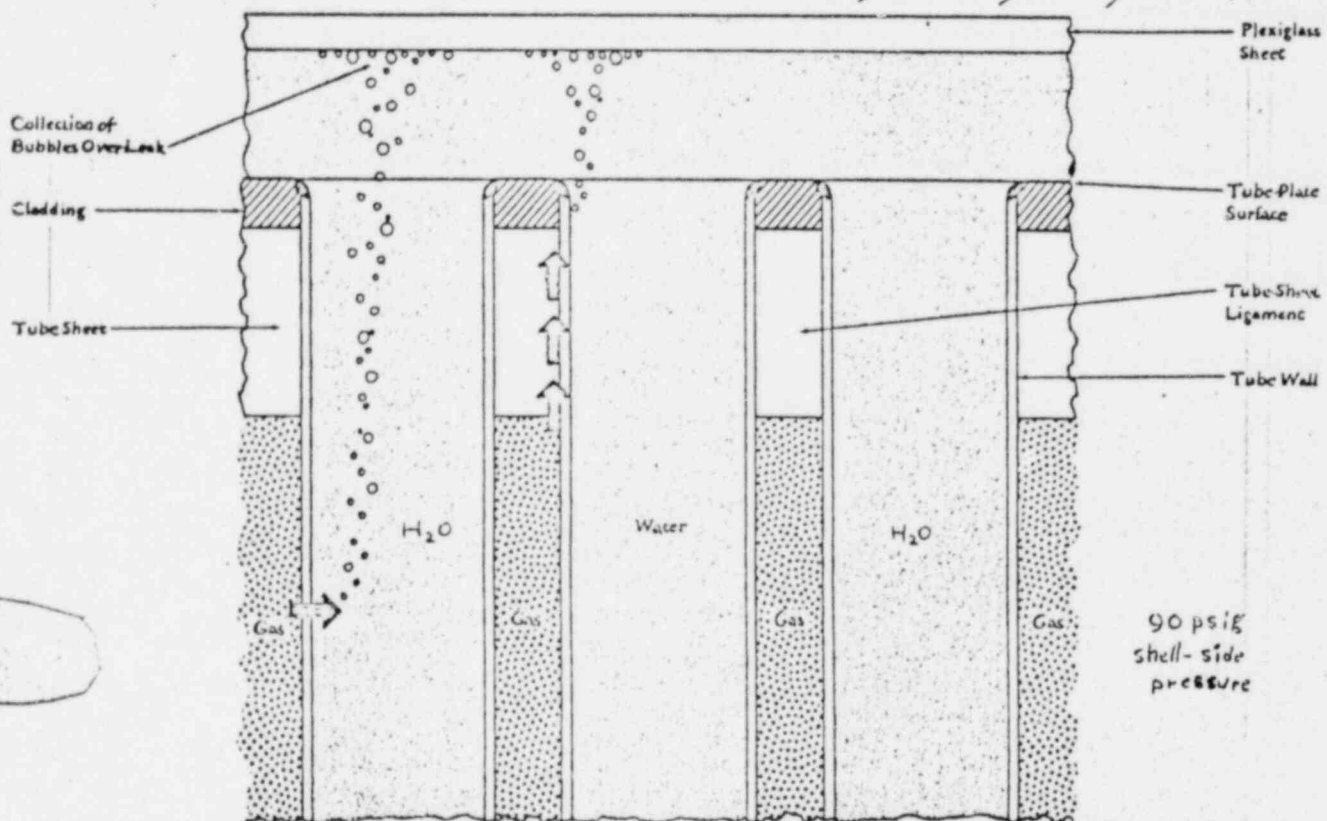
- 1--Three layers of Inconel weld-deposit cladding are applied to the face of the tube sheet, providing filler metal for fusing to carbon-steel tubes.
- 2--After finish machining, the integrity of the Inconel cladding is tested ultrasonically.
- 3--Tube-sheet holes are drilled with an automatic tape-controlled machine, insuring accurate spacing of the holes.
- 4--Tubes are inserted and, after light rolling to hold the tubes in place during the welding sequence, each tube and tube hole is counterbored. This step provides mechanical cleaning of welding surface prior to welding.
- 5--The recessed weld is made by the automatic TIG process, fusing the Inconel cladding to the carbon-steel tube.

(B)

6--The dye penetrant test is the first of several quality-control checks on the tube-to-tube-sheet weld. This test detects surface defects in the cladding and the tube weld.

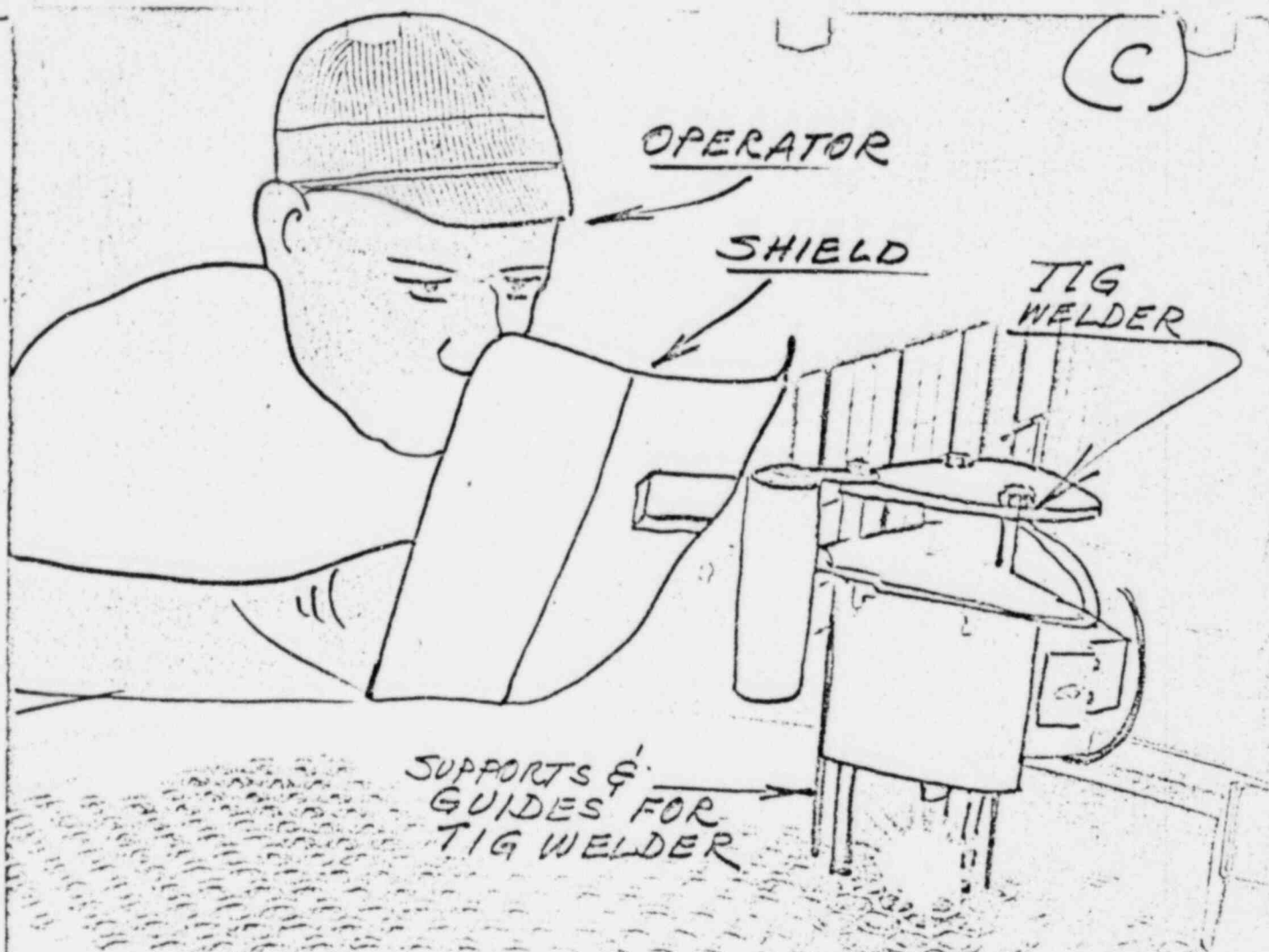
7--Carbon-steel tubes are deep rolled, starting 1/2 inch below the weld, to provide another seal against leakage and to minimize stresses on the tube weld.

*FINAL INSPECTION AND ACCEPTANCE IS INDICATED WHEN ALL OF THE CIRCLES ARE CLEAR OF COLORS RED, GREEN, BLUE, YELLOW.*



4--One of the inspection tests for tube-sheet weld quality is the lake bubble test. Air pressure is applied to the steam side of the feed-water heater prior to final tube expanding. Leaks in either the tubes or welds are detected by the bubbles that form in the pool of water covering the tube-sheet surface.

*IF AT ANY TIME THE NUMBER OF VISUAL DEFECTS IN THE TUBING EXCEEDS 1% BY ANY ONE WELDER ON ANY ONE SHIFT THE WORK IS STOPPED. WORK IS NOT RESUMED UNTIL THE CAUSE HAS BEEN FOUND AND ELIMINATED*



# STEAM GENERATOR & PRESSURIZER FABRICATION STATUS

## ORDERS SHIPPED

<u>Customer -- G.O.</u>	<u>Steam Generators</u>	<u>Pressurizers</u>
South. Cal. Edison	16-A-4320-1	16-A-4850-1
LA-14101 S.G.	" -2	
LA-14115 Pr.	" -3	
Conn. Yankee Atomic	16-A-4640-1	16-A-5112-1
BS-50001 S.G.	" -2	
BS-50004 Pr.	" -3	
	" -4	
Rochester G. & E.	16-A-5695-1	16-A-5696-1
RH-33001 S.G.	" -2	
RH-33004 Pr.		
Consolidated Edison	16-A-5780-1	Not Shipped (Comp)
NY-77201 S.G.	" -2	At Foster-Wheeler
NY-77204 Pr.	" -3	
Indian Pt. II	" -4	
Carolina P & L	16-A-6081-1	16-A-6208
CH-25401 S.G.	" -2	
CH-25404 Pr.	" -3	
Wisconsin-Michigan	16-A-6079-1	16-A-6256-1
MK-60001 S.G.	" -2	
MK-60004 Pr.		
Point Beach I		
Florida P & L	16-A-5885-1	16-A-5883
MI-16401 S.G.	" -2	Ready to Ship
MI-16404 Pr.	" -3	in W-18

## ORDERS PENDING SHIPMENT

Wisconsin-Michigan #2	16-A-6339-1	5/69	16-A-8216	5/69
MK-80001 S.G.	" -2	6/69	(Tampa)	
MK-80004 Pr.				
Florida P & L II	16-A-6341-1	7/69	16-A-8226	9/69
MI-16451 S.G.	" -2	9/69	(Tampa)	
MI-16454 Pr.	" -3	10/69		
Consolidated Edison IPP III	16-A-8173-1	2/70	16-A-8218	4/69
NY-78501 S.G.	" -2	3/70	(Tampa)	
NY-78504 Pr.	" -3	3/70		
	" -4	4/70		

ALL FUTURE FABRICATION WILL BE AT THE WESTINGHOUSE TAMPA PLANT